

## ABSTRACT

In some embodiments, methods of producing monoolefins include contacting an olefin stream with a polar solvent to extract a highly unsaturated hydrocarbon from the olefin stream, followed by contacting the polar solvent with a hydrogenation catalyst in the presence of hydrogen at conditions effective to hydrogenate the highly unsaturated hydrocarbon to a monoolefin. The monoolefin then desorbs from the polar solvent and enters the purified olefin stream, allowing the polar solvent to be recycled. In other embodiments, monoolefin production systems include an extraction-hydrogenation zone for performing the extraction and hydrogenating steps in situ. In alternative embodiments, the hydrogenation zone is disposed downstream from the extraction zone.